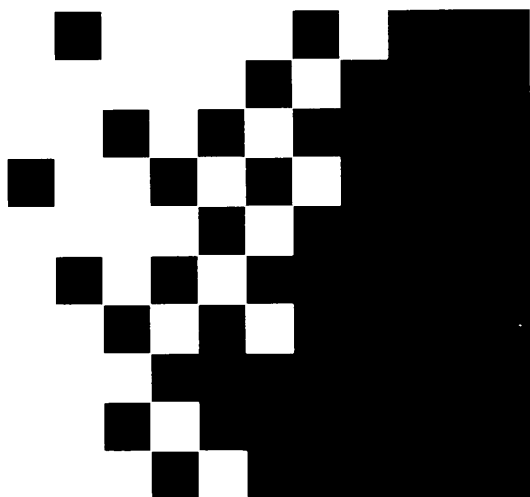


*AST Premium™
Utility Software
User's Manual*

AST
RESEARCH INC.



AST
Premium
COMPUTER PRODUCTS



AST Premium™ Utility Software

**User's Manual
February 1988
000650-001 B**

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INTRODUCING ASTMENU: THE COMMON USER INTERFACE

ASTMENU™ is a utility program that generates an easy-to-follow, menu-driven *common user interface* to help you set up and operate your AST Premium™ computer. With this common user interface, you can perform the following tasks:

- *Run ASTSETUP:* to define your computer's configuration in battery-maintained CMOS memory.
- *Run System Test:* to check out the performance of your computer's major hardware modules.
- *Install Utility Software:* to set up a RAM disk, print spooler, and/or disk cache.
- *Fixed Disk Options:* to format and partition your fixed disk and install MS-DOS.
- *Exit to MS-DOS.*

NOTES

ABOUT THIS MANUAL

How to Find What You Are Looking For

To make backup copies of your diskettes:

Section 2.1 gives a brief description of the MS-DOS commands **DISKCOPY** and **COPY *.***.

*To start up the **ASTMENU** utility:*

Section 2.3 gives both the floppy and fixed disk start up procedure.

*To run **ASTSETUP**:*

Section 3.2 describes this procedure.

To run System Test:

Section 3.3 describes this procedure.

For an overview of each utility:

Section 3.4 describes the Expanded Memory Manager, **fASTdisk**, **SuperSpool**, and **ASTCache** utilities.

To install utilities using the common user interface:

Section 4 gives installation procedures for each utility.

To custom-install utilities in DOS:

Part III (Sections 6 to 9) explain the procedure for changing utility default parameters and installing utilities in your startup disk's **AUTOEXEC.BAT** file.

To low-level format, MS-DOS format, or partition your fixed disk:

Section 5 describes each of these procedures.

To install MS-DOS on your fixed disk:

Section 5.4 describes this procedure.

Format Notation

This manual uses the following format notation:

- *Boldface characters* are items that you enter at the AST Premium keyboard.
- *Uppercase bold characters* must be entered exactly as shown. You can, however, enter this text in any combination of upper or lowercase characters.
- *Lowercase bold characters* are variables that you define (like a file name or parameter).
- *Angle brackets (< >)* tell you to press a key. For example, **< Enter >** tells you to press the Enter key.

When two or more keys are joined by a dash, press the keys simultaneously. For example, **< Ctrl > - < Alt > - < Del >** tells you to hold down the Ctrl and ALT keys while pressing the Del key. Then, release the keys simultaneously.

- *System prompts and messages* are shown in color.

PART I. GETTING STARTED

1. Before You Begin
2. Preparing for Utility Installation

NOTES



This section presents information you'll need before working with the common user interface provided by the ASTMENUE program.

1.1 Checking the Contents

Besides this manual (AST part number 000650-001), two Utility Software diskettes make up the common user interface package.

1.2 Checking the README.DOC File

If a README.DOC file exists on the Utility Software Diskette 2 of 2, review this file before working with the common user interface. README.DOC contains the latest information about your utility software and other options.

To check for a README.DOC, start your computer with a DOS boot disk. When the DOS cursor appears, insert the utility diskette 2 of 2 in drive A and enter:

TYPE A:README.DOC <Enter>

If the README.DOC file exists, it will display on your monitor screen.

NOTE

Typing **A:DIR/W** is another way to see if a README.DOC files exists. The DIR/W command displays a list of files found on the designated disk.

To print out a hardcopy of the README.DOC file, enter:

COPY A:README.DOC PRN <Enter>

1.3 Compatibility and System Requirements

ASTMENU works with *all* AST Premium computers. Where installing or operating differences exist between product lines, the text will identify the AST Premium computer associated with each installing/operating procedure.

For efficient operation, a system with one fixed and one floppy disk is recommended. However, a system with one floppy disk is sufficient for ASTMENU operation.

This section prepares you to use the ASTMENU utility.

2.1 Making Backup Diskettes

Before using this software, you should make a backup of each diskette to use as a working copy. If you lose or damage a working copy, you can replace it by making another copy of the original diskette.

To make your working copies, use the MS-DOS command **DISKCOPY**. To install the software on a fixed disk, use the MS-DOS command **COPY *.***. See the *MS-DOS User's Manual* (AST part number 000649-001) for further instructions.

2.2 Safeguarding Your Original Diskettes

After you make working copies of the Utility Software Diskettes, store your original diskettes in a cool, dry place for safekeeping.

2.3 Starting Up ASTMENU

ASTMENU resides on the Utility Software Diskettes supplied by AST Research. You can access the common user interface by starting your computer with your backup diskettes or by installing it on your fixed disk drive. Both procedures are described below.

NOTE

If you plan to run the system test or work with fixed disk options, you *must* access ASTMENU from your backup diskettes and *not* from your fixed disk.

2.3.1 Diskette Startup

To access ASTMENU with floppy diskettes, follow these steps:

STEP 1

Place the Utility Software Diskette 1 of 2 in floppy disk drive A. Be prepared to swap utility diskettes when prompted to do so by the program.

STEP 2

Turn on your computer. If your computer is already on, press the RESET button.

The Common User Interface Main Menu will automatically appear on your screen. You are now ready to perform the tasks available with the common user interface.

2.3.2 Fixed Disk Startup

If you have an AST Research fixed disk, you can access ASTMENU without using your backup diskettes by following these steps:

STEP 1

Turn on or reset your computer without using a boot diskette.

STEP 2

When you see the DOS prompt, type:

```
CD\ASTUTIL <Enter>
```

The screen will display:

```
C:\ASTUTIL>
```

where:

C: is the disk containing the ASTMENU software.

ASTUTIL > is the name of the directory containing the
ASTMENU software.

STEP 3

Type:

ASTMENU <Enter>

The Common User Interface Main Menu will appear on your screen. You are now ready to perform the tasks available with the common user interface.

NOTES

PART II. USING THE COMMON USER INTERFACE

- 3. Accessing Main Menu Options
- 4. Installing Utilities
- 5. Using Fixed Disk Options

NOTES



This section introduces the Common User Interface Main Menu and describes the options available. It also tells you how to access the options and get on-line help.

3.1 The Main Menu

The Main Menu screen (Figure 3-1) lists five options referred to as *items*.

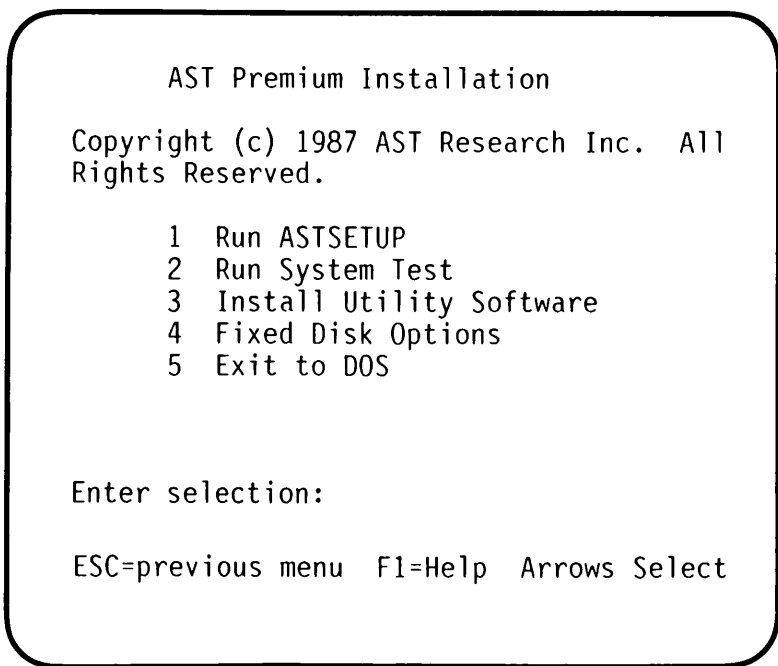


Figure 3-1. Common User Interface Main Menu.

3.1.1 Selecting a Menu Item

To select a menu item, press the **<down arrow>** key until the item is highlighted. If you pass the item you want, press the **<up arrow>** key to go back. When you have the desired item highlighted, press the **<Enter>** key to execute it.

You may also highlight an item by typing the number of the item. For example, typing **<3>** highlights *Install Utility Software*.

3.1.2 Getting Help

When you highlight a menu item, a brief message describing the item will display in a help line located below the menu list (Figure 3-2). For example, highlighting item 4 (Fixed Disk Options) will cause the message *Format, partition, and install MS-DOS* to display. This help line is present in all menu screens.

AST Premium Installation

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- 1 Run ASTSETUP
- 2 Run System Test
- 3 Install Utility Software
- 4 Fixed Disk Options
- 5 Exit to DOS

Enter selection:

Format, partition, and install MS-DOS

ESC=previous menu F1=Help Arrows Select

Figure 3-2. Main Menu Help Line.

If you need additional help about the highlighted item, press <F1>. The screen will then display a page of information about the item highlighted. To leave the help page and return to the menu, press any key.

3.2 Running ASTSETUP

ASTSETUP lets you define your computer's configuration and then writes that configuration into battery-maintained CMOS memory. Whenever you boot your computer, the configuration data tells your system the amount of memory and the types of peripheral devices available. Your system may not recognize some devices (like floppy and fixed disk drives) until you define them in ASTSETUP.

You should run ASTSETUP when you complete the hardware installation of your AST Premium computer, replace the system battery, and make any change to memory or peripheral devices. To run ASTSETUP from the common user interface, select item 1 from the main menu.

The ASTSETUP program is also stored in your computer's Read Only Memory (ROM). For additional information about running ASTSETUP or accessing it from ROM, see your *AST Premium User's Manual*.

3.3 Running System Test

System Test is a diagnostics program that checks the main hardware modules in your computer. This test runs without your intervention and provides rapid, nondestructive analysis of the overall system.

You should run the system test after completing the hardware installation and whenever you experience abnormal computer operation. To run System Test, select item 2 from the main menu.

NOTE

You should always run the system test from your working Utility Software diskettes. This will ensure that no resident programs are installed. Resident programs, like device drivers in the CONFIG.SYS file or programs installed in memory from the AUTOEXEC.BAT file, may cause erroneous results.

For more information about the System Test, refer to the Troubleshooting Section of your *AST Premium User's Manual*.

3.3.1 Autosense Mode

The System Test program starts in an autosensing mode. Autosensing allows the program to examine all device slots to determine what modules are present. The program then displays the configuration it found on your screen. This configuration data is not taken from the data stored in C-MOS memory by ASTSETUP.

If autosense does not include a device in the configuration data, the device either is not installed or is functionally nonexistent.

After autosensing, the program will begin testing detected system modules. Press any key to start the testing.

3.3.2 System Test Display

During the test (assuming no errors), the following messages will display:

Testing System Board at xxMHz
[Test(s) Completed Successfully]

Testing Single Board System Memory
[Test(s) Completed Successfully]

Testing COM Ports
[Test(s) Completed Successfully]

Testing Keyboard
[Test(s) Completed Successfully]

Testing Video Adapter
[Test(s) Completed Successfully]

Testing Parallel Printer Ports
[Test(s) Completed Successfully]

Testing Floppy Disk Subsystem
[Test(s) Completed Successfully]

Testing Fixed Disk Subsystem
[Test(s) Completed Successfully]

System Test Completed with 0 Errors

Strike any key to return to Main Menu:

NOTE

The System Test only tests those devices detected by the autosense mode. For example, if your system does not have a fixed disk, autosensing will instruct the program to bypass the fixed disk subsystem test(s). As a result, test results for that module will not display.

If System Test reports no errors, each of your modules should be at least minimally functional. If System Test reports an error, a

error message will replace the *[Test(s) Completed Successfully]* line. The total number of errors will be tallied in the *System Test Completed with* line.

3.3.2 Error Messages

If System Test reports an error message, write down the 6-digit numerical code and text associated with the error. Also, note the configuration of your system including any add-on boards or attached peripherals. Then, contact your authorized AST reseller or third-party maintenance organization for support.

For further technical assistance, you can also call the AST Research Product Support Department at (714) 863-9991.

3.4 Installing Utility Software

This option lets you install expanded memory, RAM disk, print spooler, and disk cache drivers to your boot disk. In addition, it automatically installs (if needed) expanded and/or extended memory drivers.

When you select this option, the *Install Utilities* menu will display. This menu lets you select and configure the utilities you want to install. Section 4 describes the Install Utilities option in detail.

A brief explanation of each utility follows.

3.4.1 Expanded Memory Manager

Expanded memory, also called paged memory, lets you use memory beyond the conventional limit of 640 KB for DOS applications and utilities. The term *paged memory* refers to the technique developed to access memory beyond 640 KB in the days before *extended memory* (direct-access memory in the 1-16 megabyte range). Even though many systems can use extended

memory without memory paging, expanded memory is still used because of the many popular applications that employ it.

With expanded memory, you can operate programs conforming to the Expanded Memory Specification (EMS) or Enhanced Expanded Memory Specification (EEMS) software. These programs include Lotus 1-2-3™, Symphony™, and Framework II™. Extended memory does not currently support these programs.

Extended memory can be used for fASTdisk, SuperSpool, and ASTCache installations.

These utilities will be installed in *emulated extended memory* if not enough *physical extended memory* is present. That is, the software can automatically assign the proper amount of expanded memory to act like extended memory to support these utilities.

If you want to change how much linear memory (conventional or extended) your computer has, you may need to change the switch settings on your system memory board and/or run ASTSETUP (see your *AST Premium User's Manual*).

3.4.2 fASTdisk

fASTdisk creates a virtual disk in RAM, called a RAM disk. A RAM disk acts like a fixed disk drive only much faster. If an application reads from or writes to a disk frequently, storing it on a RAM disk can speed up the application considerably.

Because the RAM disk exists only in memory, all information it contains disappears when you turn off or restart your computer. For this reason, you should save RAM disk files to a diskette or fixed disk before shutting off or resetting your computer. You should also save your work frequently during computer sessions.

3.4.3 SuperSpool

SuperSpool creates a print spooling buffer in RAM that receives print files and relays them to the printer. Because SuperSpool can accept information faster than the printer, your computer is tied up less time while sending the file to print. As soon as SuperSpool has the file, you can begin using your computer for other work even though the file is still printing.

For example, if you want to run a BASIC program, you can use SuperSpool to print a listing of the program while it is executed on your computer. The program code can be dumped into SuperSpool and then run when computer control returns to the operating system.

3.4.4 ASTCache

ASTCache creates a disk cache in RAM. A disk cache accumulates copies of recently-used disk sectors and stores them for future use. Your computer searches the cache first for necessary information before accessing the fixed or floppy disk drive. If it finds the information in the cache, it does not have to access the disk. This increases the application's performance.

Like fASTdisk, ASTCache must be set up each time you start or reset your computer. Unlike fASTdisk, however, the cache stores only copies of sectors. The original sectors exist in external storage (fixed or floppy disk) and changes made to the cache are written to the disk immediately. There is never a danger of losing information stored in ASTCache.

When ASTCache is full and new information needs to be added, ASTCache discards the least-recently-used sectors to make room. Once again, the discarded sectors are not lost, only removed from the cache.

3.5 Selecting Fixed Disk Options

Selecting Fixed Disk Options brings up another menu that provides initialization options for your fixed disk drive. These options include:

- Perform Low-Level Format.
- Partition Fixed Disk.
- Perform MS-DOS Format.
- Install MS-DOS.

CAUTION

All fixed disks supplied by AST Research are formatted and partitioned at the factory and shipped with MS-DOS already installed. Formatting your AST-supplied fixed disk will erase all information stored there. If you have a third-party fixed disk, check with the manufacturer before using these fixed disk options.

Fixed disk options are described in detail in Section 5.

3.6 Exiting to DOS

This option exits the common user interface and returns you to DOS.

NOTE

You can also exit to DOS by pressing the **<Esc>** key while in the common user interface main menu.

NOTES



This section explains how to install the fASTdisk, SuperSpool, and ASTCache utilities using the common user interface.

To begin the installation, highlight and select item 3 from the Common User Interface Main Menu. This can be done by pressing the <down arrow> key three times to highlight the item and the <Enter> key to select it. Or, you can simply type <3> and press <Enter>.

The Install Utility Software Menu (Figure 4-1) will display.

Install Utility Software

Device	Memory Size	Memory Type	Comment
1	Install/Delete	Expanded Memory Manager	
2	Install/Change/Delete	fASTdisk 1	
3	Install/Change/Delete	fASTdisk 2	
4	Install/Change/Delete	ASTCache	
5	Install/Change/Delete	SuperSpool	
6	Save configuration		
7	Return to main menu		

Enter selection:

ESC = previous menu F1 = Help Arrows select

Figure 4-1. The Install Utility Software Menu

4.1 Installing Expanded Memory Manager

To install the Expanded Memory Manager, follow these steps:

STEP 1

From the Install Utility Software Menu, select item 1.

The Expanded Memory Manager Menu will display.

STEP 2

Select item 1 to install (or item 2 to delete) the expanded memory manager. If installing the manager, you will be prompted to allocate the amount of expanded memory desired. If deleting the manager, you will return to the Install Utility Software Menu.

STEP 3

If installing the manager, enter the amount of expanded memory desired. The balance of your non-conventional memory will be available for extended memory devices. After pressing <Enter>, you will return to the Install Utility Software Menu.

NOTE

If your system has only extended memory, you must reconfigure it to allow for some expanded memory. Refer to your *AST Premium User's Manual* for further instructions.

Although you allocated a specific amount of expanded memory in Step 3 above, the system may borrow some or all of that memory to use for extended memory devices. To secure the specific amount of expanded memory you allocated, do not assign more extended memory than is available.

The amount of available extended memory is determined by how much expanded memory you allocate.

4.2 Installing fASTdisk

To install one or two fASTdisks, follow these steps:

STEP 1

From the Install Utility Software Menu, select item 2 for the first fASTdisk or item 3 for the second fASTdisk.

A Memory Type Selection Menu will display.

STEP 2

Select the memory type desired.

The Memory Type Selection Menu lets you choose where in memory you want fASTdisk to reside. The memory types available are conventional and extended memory.

In most cases, you should install fASTdisk and other utilities in extended memory (memory in the 1-to-16-megabyte range). Conventional memory (the first 640 kilobytes of your system's memory) should be reserved for executing your application programs and placing a fASTdisk there may restrict your use of applications that require a great deal of memory.

If your system is *not* configured to recognize installed memory above conventional, the program will install the appropriate memory driver(s) automatically if you select extended memory for fASTdisk installation. If your system is already configured for extended memory, drivers will not be installed unless you lack the necessary amount of extended memory.

NOTE

For more information about memory types, see your *AST Premium User's Manual*.

After you press <Enter>, a Memory Size Selection Menu will display.

STEP 3

Type the amount of memory in kilobytes (KBs) that you want to allocate to fASTdisk and press **< Enter >**.

NOTE

If the default memory displayed is adequate, just press **< Enter >**.

Typing **< Enter >** will return you to the Install Utility Software Menu.

STEP 4

Repeat this procedure for the second fASTdisk, if desired.

4.3 Installing ASTCache

To install ASTCache, follow these steps:

STEP 1

From the Install Utility Software Menu, select item 3.

A Memory Type Selection Menu will display.

STEP 2

Select the memory type desired.

The Memory Type Selection Menu lets you choose where in memory you want your ASTcache to reside. The memory types available are conventional, extended, and expanded memory.

In most cases, use extended or expanded memory for ASTCache installation. Conventional memory (the first 640 kilobytes of your system's memory) should be reserved for executing your application programs and placing ASTCache there may restrict your use of applications that require a great deal of memory.

If your system is *not* configured to recognize installed memory above conventional, the program will install the appropriate memory driver(s) automatically if you select extended memory for fASTdisk installation. If your system is already configured for extended memory, drivers will not be installed unless you lack the necessary amount of extended memory.

NOTE

For more information about memory types, see your *AST Premium User's Manual*.

After you press <Enter>, a Memory Size Selection Menu will display.

STEP 3

Type the amount of memory in KBs that you want to allocate to ASTCache and press <Enter>.

NOTE

If the default memory displayed is adequate, just press <Enter>.

Pressing <Enter> will return you to the Install Utility Software Menu.

4.4 Installing SuperSpool

To install SuperSpool, follow these steps:

STEP 1

From the Utility Software Menu, select item 5.

A Memory Type Selection Menu will display.

The Memory Type Selection Menu lets you choose where in memory you want SuperSpool to reside. The memory types available are conventional and extended memory.

In most cases, you should install SuperSpool and other utilities in extended memory (memory in the 1-to-16-megabyte range). Conventional memory (the first 640 kilobytes of your system's memory) should be reserved for executing your application programs and placing SuperSpool there may restrict your use of applications that require a great deal of memory.

If your system is *not* configured to recognize installed memory above conventional, the program will install the appropriate memory driver(s) automatically if you select extended memory for fASTdisk installation. If your system is already configured for extended memory, drivers will not be installed unless you lack the necessary amount of extended memory.

NOTE

For more information about memory types, see your *AST Premium User's Manual*.

STEP 2

Select the memory type desired.

After you press <Enter>, a Memory Size Selection Menu will display.

STEP 3

Type the amount of memory in KBs that you want to allocate to SuperSpool and press <Enter>.

NOTE

If the default memory displayed is adequate, just press <Enter>.

After you press <Enter>, a Device Selection Menu will display.

STEP 4

Select the parallel port (LPT1/LPT2) that SuperSpool will buffer.

Pressing < **Enter** > will return you to the Install Utility Software Menu.

4.5 Saving Configuration

After installing the utilities you want, save the utility configuration by selecting item 5 (*Save Configuration*) from the Install Utilities Menu. This item writes the displayed utility configuration to your boot disk. This means the utilities you select will be available every time you start or restart your computer.

NOTE

The expanded and extended memory drivers will be installed automatically, if required by your memory configuration.

4.5.1 System Memory Usage Summary

When you select Save Configuration, a system memory usage summary (Figure 4-2) will display.

SYSTEM MEMORY USAGE SUMMARY

	Conventional	Extended	Expanded
In System	640	0	1400
After emulation	640	576	832
Used by devices	0	576	256
Remaining	640	0	576

Press any key to continue:

Figure 4-2. System Memory Usage Summary.

This summary shows your system's memory configuration before and after utility software installations. The first line lists the amount of system memory before utility installations. Line two lists how system memory was rearranged by the extended memory emulator utility (if installed). Line three lists the amount of memory used by utilities. And line four lists the total amount of memory remaining after utility installations.

The totals in line four must be positive values or zeros. A negative value means you assigned more memory to utilities than you have available. A warning message will display when you try to return to the Install Utility Software Menu.

4.5.2 Returning to the Install Utilities Menu

After examining system memory usage summary, you can save the utility configuration and return to the Install Utility Software Menu by pressing any key.

When you return to the Install Utility Software Menu, the utility configuration you saved will display in a table above the menu items (Figure 4-3).

Install Utility Software

Device	Memory Size	Memory Type	Comment
Fastdisk 1	512	Extended	
Astcache	256	Expanded	
SuperSpool	64	Extended	LPT1

- 1 Install/Delete Expanded Memory Manager
- 2 Install/Change/Delete fASTdisk 1
- 3 Install/Change/Delete fASTdisk 2
- 4 Install/Change/Delete ASTCache
- 5 Install/Change/Delete SuperSpool
- 6 Save configuration
- 7 Return to main menu

Enter selection:

ESC = previous menu F1 = Help Arrows select

Figure 4-3. Utility Configuration Display.

4.5.3 Changing Utility Configuration

If you want to change your utility configuration, follow the steps in Section 4.1 through 4.4 (as applicable) and assign different values. Then, save the new configuration as directed in this section.

4.6 Return to Main Menu

When you have saved your utility configuration, you can return to the the common user interface main menu by selecting item 6 or pressing **<Esc>**.

This section described the options available in the common user interface for setting up a fixed disk drive. To examine these options, select item 4 (*Fixed Disk Options*) from the Common User Interface Main Menu.

The Fixed Disk Options Menu (Figure 5-1) will display.

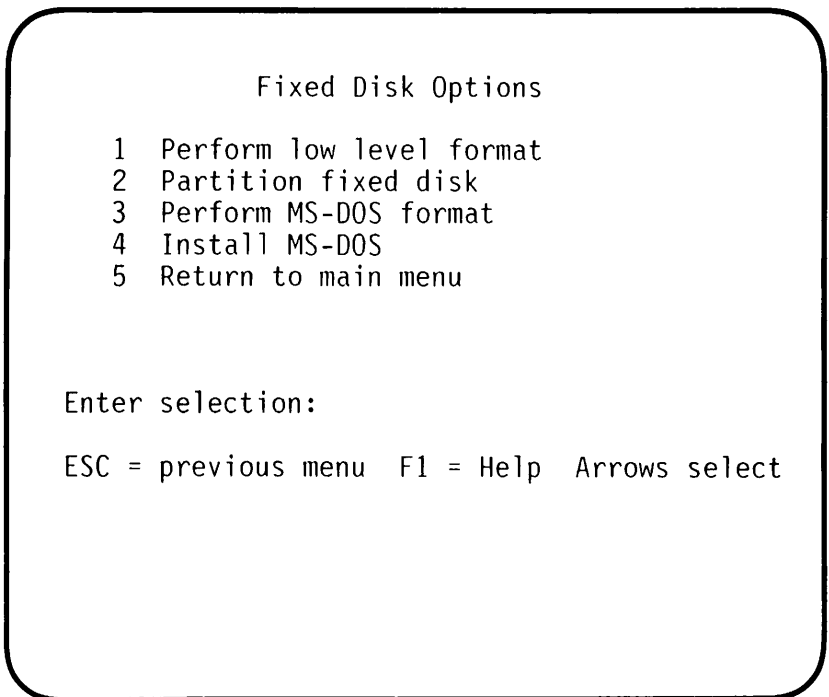


Figure 5-1. Fixed Disk Options Menu.

5.1 Performing Low-Level Format

The *Low-Level Format* option creates a data structure within the disk. This structure includes key flags that identify sector, head, and cylinder associated with each data block. Without this structure, disk hardware would not have an organized way to store and retrieve data.

All fixed disks supplied by AST Research have been low-level formatted during manufacturing. It should not be necessary to use this option with an AST Research fixed disk unless you want to reformat it.

WARNING

Reformatting permanently erases the existing structure of the disk and any data files stored on the disk. Before reformatting, make diskette copies of all important fixed disk data.

To format or reformat your fixed disk, follow these steps:

STEP 1

From the Fixed Disk Options Menu, select item 1.

A warning that you are about to erase all the data on your fixed disk will display.

STEP 2

Strike any key to continue.

The Fixed Disk Format Menu will display.

This menu displays three items: *Select*, *Format*, *Exit*. A help line below the items gives a brief description of the item highlighted.

STEP 3

Select the *Select* item, using the **< left arrow >** and **< Enter >** keys.

The program will prompt you to enter drive 0 (first drive) or drive 1 (second drive) and to select whether your fixed disk drive model is 506 or ESDI.

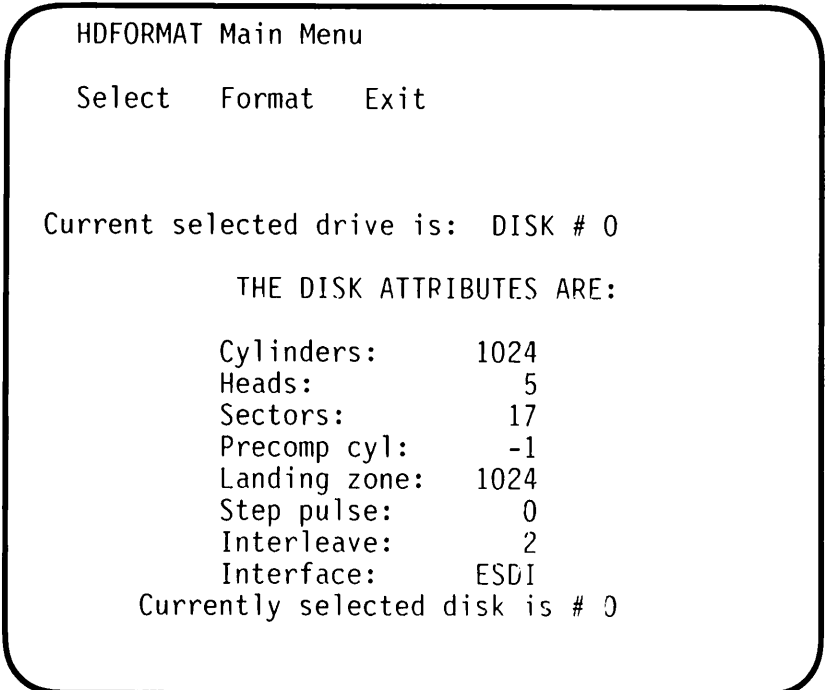
NOTE

If you are unsure of what disk drive model you have, contact your dealer or AST product support for assistance.

STEP 4

Make drive selections and press <Enter> to return to the Fixed Disk Format Menu.

When you return to the Fixed Disk Format Menu, a list indicating the selected fixed disk and its attributes will be added (Figure 5-2).



The screenshot shows a text-based menu for 'HDFORMAT Main Menu'. It lists three options: 'Select', 'Format', and 'Exit'. Below this, it states 'Current selected drive is: DISK # 0'. Then, it says 'THE DISK ATTRIBUTES ARE:' followed by a list of disk specifications: 'Cylinders: 1024', 'Heads: 5', 'Sectors: 17', 'Precomp cyl: -1', 'Landing zone: 1024', 'Step pulse: 0', 'Interleave: 2', and 'Interface: ESDI'. Finally, it says 'Currently selected disk is # 0'.

```
HDFORMAT Main Menu

Select    Format    Exit

Current selected drive is:  DISK # 0

      THE DISK ATTRIBUTES ARE:

Cylinders:      1024
Heads:          5
Sectors:        17
Precomp cyl:    -1
Landing zone:   1024
Step pulse:     0
Interleave:     2
Interface:      ESDI
Currently selected disk is # 0
```

Figure 5-2. Format Fixed Disk Menu with Disk Attributes.

STEP 5

Select the *Format* item from the Format Fixed Disk Menu. A Format Options Menu will display.

This menu displays three items: *Nformat*, *Dformat*, *Interleave*. A help line below the items gives a brief description of the item highlighted.

Nformat performs a low-level format of the selected fixed disk without identifying bad sectors using a defect list. Select this option only if there are no bad sectors on your fixed disk. *Dformat* performs a low-level format after you manually identify the bad sectors at the keyboard using the defect list.

The *Interleave* item lets you select the number of times the disk must revolve before completely reading a track. The default is 2 to 1 (or two disk revolutions). AST Premium Workstation fixed disks require a 3-to-1 interleave while ESDI disk drives require only 1 to 1.

WARNING

Selecting an improper interleave can cause a marked reduction in fixed disk speed. Contact your dealer or AST Premium or AST Product Support if you are unsure of the correct interleave.

STEP 6

Check the interleave attribute. If the default (or current setting) is not correct for your fixed disk, select the *Interleave* item. When prompted, enter the correct interleave number and press **<Enter>** to return to the Format Options Menu.

If the interleave attribute is correct for your fixed disk, skip this step and go on to step 7.

STEP 7

Select *Dformat* if you have a bad sector map or other defect list of your fixed disk.

If you selected *Dformat*, the program will prompt you to enter the defect list at the keyboard. After completely entering the list and pressing <Enter>, the Level of Format Verification Menu will display.

If you selected *Nformat*, the Level of Format Verification Menu will display immediately.

The Level of Format Verification Menu displays three items: *None*, *Quick*, *Full*. *None* means that the program will provide no verification of the formatting. *Quick* means that the program will run three quick read-write verifications of each sector. *Full* means that the program will run seven full read-write verifications of each sector.

The fewer the verifications run, the faster the program will finish formatting.

STEP 8

Select the level of verification desired. The following warning will display:

WARNING: All data on the disk will be lost!
Proceed?

STEP 9

Select Yes to proceed with formatting. Just type <Y> or press the <right arrow> and <Enter> keys.

After you select Yes, the screen will display a table counting down the sectors, tracks, heads, and cylinders being formatted.

To select No, type <N> or press the <Esc> key. Selecting No returns you to the Fixed Disk Options Menu.

STEP 10

After formatting is complete, hit any key to return to the Fixed Disk Options Menu.

5.2 Partitioning the Fixed Disk

The *Partition Fixed Disk* option sets up two MS-DOS partitions in fixed disk memory. A partition is an area of fixed memory size within the physical disk. The primary partition is bootable and contains the logical disk drive C. The extended partition is not bootable and contains all other logical disk drives.

To set up MS-DOS partitions on your fixed disk, select item 2 from the Fixed Disk Options Menu. When the FDISK Menu displays, follow the instructions found in the *MS-DOS User's Manual* (AST part number 000649-001) for configuring the fixed disk.

WARNING

Selecting this option will destroy all data on your fixed disk. Be sure to backup your fixed disk first.

5.3 Performing MS-DOS Format

The *MS-DOS Format* option performs a high-level format that structures the data sectors of the disk so MS-DOS can recognize and use them. A high-level format permanently erases data stored on your disk but does not effect the key flags set up by the low-level format procedure (Section 5.1).

To perform an MS-DOS Format, follow these steps:

STEP 1

Select item 3 from the Fixed Disk Options Menu. The following prompt will display:

Choose drive to format:

STEP 2

Type the letter of the drive to format and press <Enter>. The screen briefly displays formatting information and returns to the Fixed Disk Options Menu when formatting is complete.

NOTE

For additional information on MS-DOS formatting, refer to the FORMAT command in the *MS-DOS User's Manual*.

5.4 Installing MS-DOS

The Install MS-DOS option performs an MS-DOS format and copies MS-DOS files from your backup diskettes to your fixed disk.

To install MS-DOS, follow these steps:

STEP 1

Select item 4 from the Fixed Disk Options Menu. A DOS Country Code Selection Menu will display.

STEP 2

Select the appropriate country. The following message will display:

SELECT is used to install DOS the first time. SELECT erases everything on the specified target and then installs DOS. Do you want to continue (Y/N)?

STEP 3

Type <Y> to continue the MS-DOS formatting procedure.

After typing <Y>, the following warning will display:

WARNING: ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!
Proceed with Format (Y/N)?



STEP 4

Type <Y> to continue the MS-DOS formatting procedure.

Typing <N> in step 3 or 4 will end this procedure and return you to the Fixed Disk Options Menu (Figure 5-1).

STEP 5

When prompted, insert the backup copy of each of your MS-DOS diskettes into your floppy disk. Press any key to continue. MS-DOS files being copied will appear on your screen.

After all MS-DOS files have been copied, press any key to continue.

STEP 6

When prompted, select the number of logical disk drives on your fixed disk. You can determine the correct number by examining the primary and extended partitions in the *Partition Fixed Disk* option. The primary partition will have only one logical drive (C) but the extended partition can have from one (D) to 23 (D to Z).



After selecting the number of logical drives, you will return to the Fixed Disk Options Menu.

5.5 Returning to the Common User Interface Main Menu

After completing work with the fixed disk options, you can return to the Common User Interface Main Menu by selecting item 6 from the Fixed Disk Options Menu.



NOTE

Typing <Esc> will also return you the the Common User Interface Main Menu.

NOTES

PART III. CUSTOMIZING UTILITIES

6. Expanded/Extended Memory Software
7. fASTdisk
8. SuperSpool
9. ASTCache

NOTES

This section gives a detailed description of the functions and parameters for the expanded/extended memory manager software drivers supplied with your AST Premium computer. However, the common user interface (described in Part II) is the most efficient method for installing these drivers. This information is provided as a reference for more advanced users who want to configure the expanded/extended memory manager drivers manually.

This section includes the following information:

- Expanded and extended memory defined (Section 6.1).
- Expanded memory in the AST Premium/386 (Section 6.2).
- Expanded and extended memory in the AST Premium/286 and the AST Premium Workstation (Section 6.3).

6.1 Definitions

This section provides brief definitions of expanded and extended memory. For more detailed information, see the *User's Manual* for your AST Premium computer.

Expanded memory is memory beyond the MS-DOS 640-kilobyte (KB) limit that is accessed through a process called memory paging. In fact, expanded memory is also known as paged memory. Special software is required to take advantage of expanded memory.

Extended memory is linear memory in the 1- to 16-megabyte (MB) range. Under MS-DOS, extended memory is usually reserved for RAM disks and print spoolers. The XENIX and OS/2 operating systems can address extended memory directly.

6.2 Premium/386 Expanded Memory

To use AST Premium/386 expanded memory, ASTEMM™ software is required. ASTEMM is an expanded memory manager designed exclusively to take advantage of the 80386 memory architecture. It fully emulates the Expanded Memory Specification (EMS) Version 4.0 using all available extended memory. Unlike 8088- or 80286-based system expanded memory drivers, ASTEMM emulates expanded memory operation using extended memory.

ASTEMM also supports advanced EMS Version 4.0 features such as physical page mapping throughout the first 640 KB of DOS memory. No separate expanded memory board is needed. The system can be set up to mix extended and expanded memory in any combination without changing memory board switches.

Expanded memory is mapped in and out of conventional memory by ASTEMM. The amount of EMS memory in your system can be as much as 32 MB. Version 4.0 of EMS allows, and ASTEMM supports, mapping in not only a 64-KB window (called the EMS page frame) but also mapping of an additional forty 16-KB blocks covering the entire first 640 KB of conventional memory.

6.2.1 System Requirements

ASTEMM operates with the following minimum hardware and software requirements:

- AST Premium/386 computer.
- At least 1 MB of extended memory with the starting address of 1 MB. AST Premium/386 computer models 300 and 340 must be upgraded with this additional 1 MB before they can use ASTEMM.

ASTEMM uses approximately 2 KB of conventional memory and 52 KB or more of extended memory for program code. The actual amount of extended memory used varies depending upon the amount of extended memory to be managed.

6.2.2 Basic ASTEMM DEVICE Command

To install ASTEMM, copy the ASTEMM.SYS file to your boot disk and include the following device driver line in your CONFIG.SYS file:

DEVICE=drive:\path\ASTEMM.SYS options

where:

drive is any drive letter.

path is any path on that drive.

options are any keywords and parameters listed in Section 6.2.3.

If no options are listed on the device driver line, ASTEMM allocates all extended memory as expanded memory and assumes default settings.

Although not necessary, it is a good idea to place the device driver line early in your CONFIG.SYS file. It should precede other DEVICE lines in case they reference extended memory (some of which is used by ASTEMM) or expanded memory (all of which is created by ASTEMM).

6.2.3 Device Driver Options

Although several options can be added to the ASTEMM device driver line in your CONFIG.SYS file, you should find the default settings suitable in most cases. The defaults are geared to make full use of both extended and expanded memory.

If your requirements differ, use the following options to customize ASTEMM:

EMS = nnnn

Use *nnnn* kilobytes of extended memory as expanded memory. If *nnnn* is less than the total amount of extended memory, the remaining memory is available for other uses. If this option is omitted, all extended memory (up to the smaller of either 32 MB or the total extended memory) is used as expanded memory.

Enter this value in decimal kilobytes. For example, specify EMS = 1024 to use 1,024 KB (1 MB) of extended memory as expanded memory. The value of the option must be a multiple of 16 KB.

FRAME = xxxx

Use expanded memory frame of *xxxx*. If this option is omitted, ASTEMM automatically searches for an available 64 KB window in high DOS memory. The first frame checked is at E000. If this frame isn't available, locations lower in memory on 16 KB boundaries are tested.

Enter this value in hexadecimal paragraphs. For example, specify FRAME = D000 to use segment D000 as

the swapping area. This value must be on a 16-KB boundary (that is, the low-order hex digits must be x000, x400, x800, or xC00), and can be no larger than E000.

INCLUDE = xxxx L IIII

INCLUDE = xxxx-yyyy

This option allows you to mark segment xxxx of length IIII or segment range xxxx-yyyy as part of the swapping region for ASTEMM mapping. All INCLUDE values should be entered in hexadecimal and are units of 16-KB paragraphs.

CAUTION

A software malfunction will occur if a segment specified by the INCLUDE option is also specified by the EXCLUDE option (see EXCLUDE below) or if ranges specified by INCLUDE and EXCLUDE overlap.

Use this option in either form to increase the swapping region size using specific memory addresses in high or low DOS. For example, an EGA can drive a monochrome or color monitor. If your system only has a single display adapter, you can include the region reserved for the display adapter you don't have. If you have a color monitor only, use INCLUDE = B000-B800. If you have a monochrome monitor, use INCLUDE = B800-C000.

You can also include multiple ranges separated by commas. For example, you can use INCLUDE = aaaa-bbbb, cccc L IIII, xxxx-yyyy to specify three non-consecutive ranges.

EXCLUDE = xxxx L IIII

EXCLUDE = xxxx-yyyy

This option allows you to exclude segment xxxx of length IIII or segment range xxxx-yyyy from the swapping region

for ASTEMM mapping. All EXCLUDE values should be entered in hexadecimal and are units of 16-KB paragraphs.

CAUTION

A software malfunction will occur if a segment specified by the EXCLUDE option is also specified by the INCLUDE option (see INCLUDE above) or if ranges specified by EXCLUDE and INCLUDE overlap.

Use this option in either form to decrease the swapping region size by excluding specific memory addresses in high or low DOS. For example, if you don't use programs that take advantage of the additional swapping region (like DESQview™ or Microsoft® Windows 2.0), your system's performance may improve if you exclude the region from 64 KB to 640 KB. To do so, use EXCLUDE = 1000-A000.

You can also exclude multiple ranges separated by commas. For example, you can use EXCLUDE = aaaa-bbbb, cccc-Llll, xxxx-yyyy to exclude three non-consecutive ranges.

6.2.4 ASTEMM Initialization Messages

The ASTEMM utility may display one or more of the following messages during installation:

ASTEMM -- Version x.xx (C) Copyright 1987 AST Research, Inc.
This initial message is displayed whenever the device driver is called.

The following initialization messages display only if the program encounters a fatal error. In the case of a fatal error, ASTEMM terminates without installing itself.

This program requires DOS 3.00 or later.

The operating system must be MS-DOS 3.00 or later.

Unable to move code to extended memory -- error code xx.

For some reason, the BIOS failed to move ASTEMM to extended memory. The error code (xx) indicates the type of problem. For example, 01 is a parity error, 02 means an exception interrupt occurred, 03 indicates failure of a gate address line. These errors generally involve a memory chip or system board failure.

Unable to enter protected mode -- error code xx.

For some reason, the BIOS failed to handle the call to enter protected mode.

Duplicate keyword.

A keyword on the DEVICE = ASTEMM.SYS line in your CONFIG.SYS file occurs more than once. Edit the line to remove one of the keywords and restart your system.

Unknown keyword on DEVICE = line in CONFIG.SYS.

A keyword on the DEVICE = ASTEMM.SYS line in your CONFIG.SYS file cannot be deciphered. Refer to the list of valid keywords in Section 6.4.2, edit the file to correct the problem, and restart your system.

Specified EMS frame overlaps RAM or ROM.

The EMS page frame starting at the FRAME = value overlaps some RAM or ROM that is above the display adapters. Edit the line to specify another value.

Insufficient room for EMS page frame.

There isn't a contiguous 64 KB block above the display adapters for the EMS frame. This usually means that there is too much existing ROM to allow enough contiguous addresses for the physical EMS page frame.

Invalid starting segment or length.

A keyword like INCLUDE or EXCLUDE has an invalid starting segment or length parameter. See Section 6.2.3 for more information about parameter limits.

Missing equal sign.

A keyword must be followed by an equal sign before entering a value. For example, EMS = 1024. Edit the line to correct this problem and then restart your system.

Missing length indicator.

The length indicator L must precede the memory length value. Edit the line to correct the problem and then restart your system.

Not enough extended memory available for EMS = option.

The EMS = value exceeds the available extended memory. Edit the line to specify a smaller value and then restart your system.

Not enough extended memory available for program storage.

The amount of extended memory is insufficient to store the program. Add more extended memory to your system.

Memory manager NOT installed.

A fatal error (like one of those above) has occurred.

The following initialization messages describe non-fatal errors. In each case, the program is able to recover from the error, although in some cases the recovery may be insufficient to allow the program to be installed.

EMS = size must be a multiple of 16KB --rounding up.

The EMS = value is not a multiple of 16. Edit the line to specify another value.

EMS = limit is smaller of 32 MB and existing memory -- using maximum.

The EMS = value is limited to the smaller of 32 MB and the amount of available extended memory. Edit the line to specify a smaller value.

FRAME = segment may be no longer than xxxx -- using maximum.

The FRAME = value overlaps system ROM starting at xxxx + 1000 in hex. Edit the line to specify a smaller value.

FRAME = segment must be on a 16KB boundary -- rounding down.

The FRAME = value is not on a 16 KB boundary (the possible values are x000, x400, x800, and xC00, where x is a hex digit which refers to a segment in high memory). Edit the line to specify another value.

6.2.5 ASTEMM Critical Error Messages

Critical error messages occur after ASTEMM has been installed in your system and you begin to use it. Any of the following messages can display:

A stack fault has occurred at memory address xxxx:zzzz.

This error might occur under normal circumstances when a program attempts to place data onto the stack or when a hardware interrupt (like a timer tick) occurs and there is insufficient room on the stack. The address mentioned in the message may be of help in finding the faulty code.

This message results from a bug in application code, not a bug in ASTEMM.

The following messages all occur because of internal errors within the program. Please contact AST Research, Inc. if you encounter any of the following error messages:

A double fault has occurred

An invalid TSS fault has occurred

A segment not present fault has occurred

A page fault has occurred

An internal system error has occurred

A DMA page fault has occurred

A TSS page fault has occurred

A page not present fault has occurred

A MAPTAB fault has occurred

Each of the above messages is followed by the phrase:

at memory address xxxx:xxxx.

Press any key to reboot the system.

When you contact AST Research with a description of the error, please have available the address mentioned in the error message and your ASTEMM version number.

6.3 Premium/286 and Premium Workstation

The Install Utilities option on the common user interface allows you to automatically install REMM (the expanded memory manager) and REX (the extended memory emulator) when needed. Therefore, you do not need to read the information in this section unless you want to install REMM and REX yourself.

6.3.1 REMM and REX Defined

REMM is the device driver that allows you to configure your computer's memory as expanded memory.

REX interfaces with the REMM program to allow your AST Premium computer to use expanded memory for fASTdisk and SuperSpool. REX makes expanded memory emulate extended memory, outside of the 0 - 640 KB area, to enable the use of these programs.

REX intercepts calls on read-only memory basic input/output system (ROM BIOS) functions designed for extended memory use, and interfaces them to REMM software so that they can use expanded memory.

NOTE

If REX is needed, it must be installed after the REMM software, and it cannot function without REMM software.

6.3.2 Modifying REMM and REX

As installed with the common user interface, REMM and REX should not require further modification. However, the information in this section is provided as a reference for programmers.

You can add these statements to your CONFIG.SYS file to change the default REMM and REX software drivers:

```
DEVICE=REMM.SYS [/X] [/P] [/S] [/D] [/C]
```

and/or

```
DEVICE=REX.SYS [nnnn]
```

This section describes the parameters you can use with each of these statements.

DEVICE = REMM.SYS Parameters

You can append multiple parameters to the DEVICE = REMM statement. Separate parameters with one blank space. This section describes the following REMM parameters:

```
DEVICE=REMM.SYS [/X] [/P] [/S] [/D] [/C]
[/N]
```

With the exception of the /X parameter, the following are intended for software developer use.

/X = -- Exclude

The /X parameter allows you to exclude certain ranges of memory from REMM mapping. REMM will never map into memory space that is already occupied, but you may have an application for which you would like to reserve certain memory ranges.

Format: /X=nnnn-nnnn

where *n* is a hexadecimal digit. The first *nnnn* is the starting address of the range, and the second *nnnn* is the ending address.

You can specify multiple ranges as long as you separate each address range with one blank.

Default: None excluded.

Example: DEVICE=REMM.SYS /X=A000-C3FF
 /X=E000-EFFF

You must leave at least one contiguous 64-KB segment of memory available for mapping by REMM. The default and preferred mapping is to the 64-KB page at address 0D000h. In other words, you cannot use the /X parameter to exclude all contiguous 64 segments that start in that range.

If your system uses an EGA monitor and adapter, you might need to exclude the address range 0A000h-0C3FFh.

/PIDS = or /P = -- Process IDs

The /P parameter limits the number of Process IDs or "EMM Handles" that REMM will allow. A *Process ID* is the identification assigned to each user or application on the system.

Format: /PIDS=*n* or /P=*n* (short form)

where *n* is a decimal number from 2 to 256.

Default: The default value is 32.

Example: DEVICE=REMM.SYS /PIDS=12

NOTE

Increasing the number of Process IDs increases the amount of memory used by REMM.

/START = or /S = -- Start

The /S parameter tells REMM to put logical page 0 of the mapping window at the specified segment address. This hexadecimal address must be on a 16 KB boundary, and must be within the range 0C000 through 0E000h.

Format: /START=*nnnn*

where *n* is a hexadecimal digit.

Default: Determined dynamically by REMM.

Example: DEVICE=REMM.SYS /START=C000

/DEPTH = or /D = -- Depth

The /D parameter specifies the maximum number of mapping register contexts per Process ID that REMM can save. Refer to the Enhanced Expanded Memory Specification (AST part number 020022-001) for a more detailed description of this parameter. Unless you are developing software, the default value should be adequate.

Format: /DEPTH=nn

where *nn* is any decimal number from 1 to 32.

Default: The default value is 5.

Example: DEVICE=REMM.SYS /DEPTH=15

/CONTEXTS = or /C = -- Total Contexts

The /C parameter specifies the total number of mapping register contexts that can be saved for all Process IDs combined. Unless you are developing software, the default value should be adequate.

Format: /CONTEXTS=nnn

where *n* is a decimal digit.

Default: The value of DEPTH plus the value of PIDS minus one.

Example: DEVICE=REMM.SYS /CONTEXTS=36

NOTE

The value of CONTEXTS cannot be less than the value of PIDS.

/N -- Nomenclature

The /N parameter causes an informational message similar to the following to be displayed during bootup:

```
Expanded Memory Manager          Version 1.00
(c) Copyright AST Research, Inc. 1985, 1990 All Rights Reserved
KB Block      Board at Port
1152          0208
1024          0256
Expanded Memory Pages:      16
Manufacturer:  AST
FreeExt. Mem:      32
Contiguous:      32
Depth:      5
Mode:      1F
```

DEVICE = REX.SYS Parameters

The common user interface allows you to automatically configure and install the appropriate command statement for REX.

Format: `DEVICE=REX.SYS [nnnn]`

where *nnnn* is a decimal number indicating the amount of expanded memory (in KB) that REX will enable to be allocated as emulated extended memory.

Default: The default value is 512 (KB).

Example: `DEVICE=REX.SYS 1024`

This example would be appropriate, for instance, if you set up two FASTdisks and used REX to emulate 1024 KB of extended memory.

NOTE

The amount of memory allocated to REX must be at least as much as the sum of all emulated extended memory used by fASTdisk, SuperSpool, VDISK, and any other RAM disks and print spoolers set up to use memory outside the 0 - 640 KB area. If you do not express this value as a multiple of 16 KB, it will automatically be rounded up to the next highest multiple.

In most cases, the fASTdisk installed by the common user interface will meet your needs. However, if you require a custom configuration you can install one or more fASTdisks by placing the appropriate command(s) in your CONFIG.SYS file.

This section explains the format of the FASTDISK command line.

7.1 Basic fASTdisk DEVICE Command

The basic form of the DEVICE command used to install a fASTdisk in the CONFIG.SYS file is:

DEVICE=FASTDISK.SYS

If this command is placed in the CONFIG.SYS file, the fASTdisk operates with the following default parameters:

Sector size = 128 bytes
Directory size = 64 files
Disk capacity = 512 kilobytes (KB)
Application program space = 64 KB

In the default configuration, fASTdisk uses conventional memory (0 - 640 KB), not expanded or extended memory.

7.2 Complete fASTdisk DEVICE Command

The complete form for the fASTdisk DEVICE command is as follows:

```
device=fastdisk.sys[option(s)]
```

where *option(s)* represent a list of one or more parameters described below. You can enter the parameters in any order. DO NOT separate options with a comma.

/SSIZE = xxx	Sets the sector size for fASTdisk.
/dir = xxx	Sets the number of root directory entries.
/M[= xxx]	Specifies the size of the fASTdisk.
/U = xxx	Specifies the minimum amount of memory reserved for application programs or other device drivers.
/EXTM[= xxxx[,xxxx]]	Enables fASTdisk to use emulated extended memory.
/DEXTM	Disables use of emulated extended memory.
/DL	Disables memory regions (0 - 640 KB.)
/TSIZE = xxxxx	Sets the maximum number of bytes of data that can be transferred in and out of extended/expanded memory at one time.

7.2.1 Sector and Directory Size Options

This section summarizes the sector and directory size options for the fASTdisk DEVICE command.

`/ssize = xxx`

This option sets the sector size for fASTdisk in bytes. Allowable sizes are 128, 256, or 512. The default value is 128.

`/dir = xxx`

This option sets the number of root directory entries that the fASTdisk can contain. The default is 64. The value specified can range between 2 and 512.

If the value specified multiplied by the size of the directory entry (32 bytes) does not equal a multiple of the sector size, fASTdisk automatically rounds up the number of directory entries until a multiple of the sector size is reached.

If the size of fASTdisk does not allow enough room for the directory size specified, fASTdisk automatically decreases the directory size by one sector at a time. An error message is issued if insufficient room exists for a one-sector directory. One of the directory entries holds the volume label for fASTdisk.

7.2.2 Memory Allocation Options

This section summarizes the memory allocation options for the fASTdisk DEVICE command.

/m[=xxxx]

This option specifies the size of the fASTdisk in KB. (If this option is not included in the command line the fASTdisk is 512 KB.) The range of values you can specify is between 1 and the maximum available memory on your computer.

The actual amount of memory used for the fASTdisk will be slightly more than the value specified by XXXX.

If /M is specified without any numeric value, all remaining available memory is allocated to fASTdisk. If you specify this form of the option, the /U = xxx parameter should be specified to save some memory for use by other programs.

/U = xxx

This option specifies the minimum amount of memory in KB to be reserved by applications programs or other device drivers. If you do not include this option in the command line, the default value is 64 KB. The value specified by the /U = XXX option has priority over all other memory allocation.

The value specified by /U = xxx is only a minimum; more memory may be available if you have not allocated all other memory to SuperSpool. After creating your fASTdisks, you can verify how much user memory is available by issuing the MS-DOS CHKDSK command.

If you specify the /U = xxx option to reserve space for a program other than an AST Premium computer software utility, you should use the exact same /U = xxx parameter in all subsequent fASTdisk and SuperSpool commands.

(You can specify decreasing amounts of reserved memory in subsequent AST Premium computer utility commands if each command uses space reserved by the preceding command.)

`/extm[=xxxx[xxxx]]`

This option enables fASTdisk to use of emulated extended memory. Conventional memory can also be used if necessary (/EXTM will be ignored if no emulated extended memory is available). Usually, /EXTM is specified without any numeric fields, allowing your fASTdisk to use any available emulated extended memory.

The amount of memory actually used by fASTdisk is determined by the default (512 KB) or the /M=XXX option. Once you have specified a form of the /EXTM option with a fASTdisk, or SuperSpool command, that same option is automatically applied to any following commands that do not include the /DEXTM option.

To avoid possible conflicts with some application programs, two numeric fields allow you to restrict the amount and range of emulated extended memory that fASTdisk can use.

The first field (four x's) represents the number of 1 KB blocks at or above 1 MB that fASTdisk can use. If you want to specify an offset without restricting the amount of memory to be used, specify a 0 in this field (0 indicates no limit, the default).

The second field (four x's) indicates a starting offset for the portion of memory above 1 MB that fASTdisk can use. The default value is 1024 (1 MB). Any offset specified should be at least 1024 since this is where memory above 1 MB begins.

You can specify an offset to keep fASTdisk from conflicting with other software using memory above 1 MB, such as IBM's VDISK. No such conflict occurs between fASTdisk and SuperSpool.

If VDISK is operating in extended memory, you should always place the memory used by fASTdisk after VDISK. For example, if VDISK is operating in the first 800 KB of memory over 1 MB (address 1024 to 1824 KB), and all the remaining memory is to be available for fASTdisk and SuperSpool, the parameter specified should be /EXTM=0,1824 (since $1024 + 800 = 1824$).

/DEXTM

Once the /EXTM option has been invoked in a previous command, it remains in effect for all subsequent commands except those including the /DEXTM option.

/tsize = xxxxx

Specify this option only when part of the fASTdisk is in extended or expanded memory (you have included the /EXTM option). The TSIZE option sets the maximum number of bytes of data that can be transferred in and out of expanded/extended memory at a time. You can supply any value from 16 bytes to 32,000 bytes (32 KB) with this parameter. The default value for transfer size is 2048 bytes.

The number of bytes you supply with this parameter is rounded down to the nearest multiple of 16 to yield the actual transfer size.

This option can affect interrupt handling since interrupt handling can be suspended while data transfers take place. If interrupts are being lost, decrease TSIZE.

7.3 Rules for Using fASTdisk

This section presents some guidelines for using fASTdisk:

- If the REMM and REX device drivers are installed, the fASTdisk DEVICE command must follow the REMM and REX commands in the CONFIG.SYS file.
- Because fASTdisk is installed from the CONFIG.SYS file instead of an AUTOEXEC file or MS-DOS command, fASTdisk is always installed before SuperSpool. The use or nonuse of the /EXTM option by fASTdisk is automatically applied to the SuperSpool if it is in use, or to subsequent usage of fASTdisk (unless it is disabled by /DEXTM).

NOTES



In most cases, the SuperSpool installed by using the common user interface will satisfy your needs. If you want, you can create a custom configuration for SuperSpool by issuing the appropriate SUPERSPL command, or by including in your AUTOEXEC file.

This section explains the format for the SUPERSPL command.

8.1 Preparing for SuperSpool

Before you enter your SuperSpool command, you must enter the following MS-DOS MODE command (on your MS-DOS diskette):

```
Mode lpt1:<Enter>
```

The MS-DOS response is:

```
LPT1: not redirected
```

This response is normal and does not indicate an error. The MODE LPT1: command should be issued even if you are using a serial printer. You only need to enter the MODE LPT1: command once at the start of each computing session.

8.2 Basic SUPERSPL Command

The SUPERSPL command initiates the SuperSpool utility and sets parameters for its operation.

The basic form of the SUPERSPL command for a parallel printer is:

```
SUPERSPL LPTn: [option(s)]
```

where:

LPTn represents the parallel printer port connected to your printer. All output directed to LPTn will be sent through SuperSpool.

options represents a list of one or more of the options described below. Each option begins with a slash (/). Do not separate options with a comma or a space.

/?	Displays help screen with option descriptions.
/U = xxx	Reserves memory for use by another program.
/M = [= xxx]]	Varies the default (64 KB) memory allocation to the SuperSpool buffer.
/EXTM [= xxxx[,xxxx]]	Enables use of expanded or extended memory by SuperSpool.
/DEXTM	Disables use of expanded or extended memory in the current command.
/DL	Disables memory regions between 0 and 640 KB.
/S	Stops output of print data. No data will be lost and you can restart data transmission at any time using the SUPERSPL/C command.
/C	Continues output of print data, if stopped by the SUPERSPL/S command.

The basic SUPERSPL command for a serial printer is:

```
SUPERSPL LPTn:=COMn: [option(s)]
```

where:

all output directed to *LPTn* will go through SuperSpool to the serial printer.

COMn represents the serial port the serial printer is physically connected to. For example, if your serial printer is connected to COM1, and your AUTOEXEC file contains the command:

```
SUPERSPL LPT1:=COM1:
```

All output directed to LPT1 will go to your serial printer via SuperSpool.

option(s) represents a list of one or more of the parameters described above for a parallel printer, plus any of the serial port parameters described below. Each option begins with a slash (/). Do not separate options with a comma or a space.

```
/RATE=xxx[,parity[,databits [,stopbits]]]
```

Sets serial printer configuration parameters.

```
/ON=option
```

```
/OFF=option
```

Turns on or off certain serial printer port line protocol options.

For example, a typical SUPERSPL command for a serial printer might be:

```
SUPERSPL  
LPT1:=COM1:/RATE=9600,E,7,1,/ON=XON
```

8.2.1 Help Option

This section describes the help option to the SUPERSPL command.

/?

The Help option displays the valid options that can be part of the command line. If specified, it must be the only option. It does not operate SuperSpool; it only provides information about it.

8.2.2 Memory Allocation Options

This section describes the SUPERSPL memory allocation options.

/U=xxx

This option prevents SuperSpool from using all memory for a printer buffer by reserving a minimum of XXX KB of memory for the applications program and its work space.

If you do not use the /U = XXX option, SuperSpool reserves a minimum default applications program space of 64 KB.

If you use the /U = XXX option with the SUPERSPL command to reserve space for an applications program other than an AST software utility, you must specify the exact same parameter in your fASTdisk commands. This parameter represents a total, and is not incremented with each additional command.

If you specify the /U = XXX option to reserve space for another AST utility, the allocation in different utility commands will be for different amounts.

/M [=xxx]

This option allocates XXX KB of memory to SuperSpool for use as a print buffer. If you do not use the /M = XXX option, the buffer size defaults to 64 KB. Using spool buffers of less than 4 KB is not recommended for efficient operation.

If you specify this option without a numeric parameter (/M) all remaining available memory not reserved for application program space (/U), or for MS-DOS itself, is allocated to the spool buffer. This is a powerful option because it allows for absolutely no wasted memory space after making the other necessary memory allocations.

/EXTM [=xxxx[,xxxx]]

This option allows SuperSpool to use emulated extended memory. Usually, /EXTM is specified without any numeric fields, allowing SuperSpool to use any available emulated extended memory. The amount of memory actually used by SuperSpool is determined by the /M = XXX option or the default of 64 KB.

Once you have used a form of the /EXTM option with a fASTdisk or SuperSpool command, that same option is automatically applied to any following SuperSpool or fASTdisk commands - UNLESS one of those commands disables the /EXTM option with the /DEXTM option.

To avoid possible conflicts with some application programs, two numeric fields allow you to restrict the amount and range of expanded memory that SuperSpool can use.

The first field (four x's) represents the number of 1-KB blocks at or above 1 MB that SuperSpool can use. If you want to specify an offset without restricting the amount of memory to be used, specify a 0 in this field (0 indicates no limit, the default).

The second field (four x's) indicates a starting offset for the portion of memory above 1 MB that SuperSpool can use. The default value is 1024 (1 MB). Any offset specified should be at least 1024 since this is where memory above 1 MB begins.

You can specify an offset to keep SuperSpool from conflicting with other software using memory above 1 MB, such as the DOS VDISK program. No such conflict occurs between SuperSpool and fASTdisk.

If VDISK is operating in extended memory, you should always place the memory used by SuperSpool after VDISK. For example, if VDISK is operating in the first 800 KB of memory over 1 MB (address 1024 to 1824 KB), and all the remaining memory is to be available for fASTdisk and SuperSpool, the parameter specified should be /EXTM=0,1824 (since $1024 + 800 = 1824$).

/DEXTM

Once the /EXTM option has been invoked in a previous command, it remains in effect for all subsequent commands except those including the /DEXTM option.

8.3 Stopping and Starting Printer Output

This section describes the SuperSpool options that can stop and start printer output.

/S

Stops output of print data. No data will be lost and you can restart data transmission at any time using the SUPERSPL/C command.

/C

Continues output of print data, if stopped by the SUPERSPL/S command.

8.4 Serial Printer Options

When using SuperSpool with a serial printer, these SuperSpool options replace the equivalent MODE command for Baud rate, parity, data bits, and stop bits:

/RATE = xxxx

This option sets the Baud rate of the selected serial port (110, 300, 600, 1200, 2400, 4800, or 9600). This parameter has no default, except what has been previously set for the printer, for instance, by the MS-DOS MODE command.

[,PARITY]

Parity is either N (none), O (odd), or E (even). The default is even.

[,DATABITS]

Either 7 or 8. Default is 7.

[,STOPBITS]

Either 1 or 2. If /RATE = 110, the default is 2; otherwise, the default is 1.

/ON=OPTION,...**/OFF=OPTION,...**

This option turns on and off certain serial printer port line protocol options. Output to a serial printer occurs only

when all SuperSpool printer output conditions have been met. This applies to XON/XOFF, DCD, DSR, and CTS.

Data set line conditions are determined by the state of the signals DCD, DSR, and CTS. You can make SuperSpool ignore all data set line conditions with this command:

`/OFF=DCD,DSR,CTS,XON`

You can enable any or all of these lines with a similar `/ON = option(s)` command. Whether you specify the `/ON` and `/OFF` options depends on the internal configuration of your serial printer and its cabling to the computer. XON/XOFF is enabled by `/ON = XON` and disabled by `/OFF = XON`.

The default condition of the data set line conditions is CTS and DSR ON. That is, SuperSpool must see them ON before it will output data to the printer. DCD and XON/XOFF are OFF (ignored).

Consult your printer manual for information on its particular requirements in all the above serial options.

8.5 SuperSpool Application Notes

The following sections discuss how to best handle particular tasks when using SuperSpool, such as checking on the SuperSpool status, and changing the printer configuration.

8.5.1 Determining SuperSpool Status

Once you have activated SuperSpool, you can check its status at any time by entering the appropriate SUPERSPL command. The current printer configuration and spool buffer status (number of bytes remaining to be printed) will be displayed for reference at the completion of any SUPERSPL command.

While spooling is taking place, you can enter this command at the DOS prompt to check SuperSpool status:

SUPERSPL<Enter>

8.5.2 Changing Printer Configuration

You can change the SuperSpool-directed printer port configuration when the spool buffer is empty. However, you can only modify the memory and buffer configuration options (/M, /M = XXX, or /U = XXX) after rebooting the computer.

8.5.3 SuperSpool Compatibility

The SuperSpool program is designed to be transparent to data files. The output of data files is done via the LPTn parallel port or the COMn serial port.

If you use word processing programs with custom printer selections, you can use only their parallel printer option if you want to use SuperSpool for output. Most word processing programs have special serial port drive routines that may not be compatible with the SuperSpool program. This may also be true of any other application software that allows you to customize its serial printer output parameters. These programs write directly to the hardware -- and therefore bypass the SuperSpool program.

The SuperSpool software was designed to determine its own output parameters and is not meant to contend for output resources with another program. Consult with the supplier of your other software for advice on how to disable its custom serial port driver routines.

Certain programs, especially word processors, will not instantaneously send a large document out to a printer. These programs modify the print data *on the fly*, which takes time. They will probably run faster with Superspool than without it, but not as

fast as, for example, LLISTing a BASIC program through SuperSpool.

Once the SuperSpool program has started, you can output data or files using MS-DOS COPY commands or BASIC and BASICA PRINT commands via the parallel port. the Print Screen command will also work.

Always use the SUPERSPL LPTn: = COMn: command if you want to spool to a COMn serial port. Do not use the MS-DOS MODE command as a shortcut to redirect printer output; doing so will bypass the SuperSpool software.

8.5.6 Using Buffered Printers

Certain printers, containing large *buffers*, may run slowly with SuperSpool if their buffering features are enabled. Disabling the buffer in this type of printer corrects the problem. See your printer manual for information on disabling its buffering capabilities.

This section gives you detailed instructions for using and setting up ASTCache. However, the common user interface (described in Part II) is the most efficient method for installing ASTCache. This section is provided as a reference for advanced users who may want to configure their cache software manually.

This section includes the following information about ASTCache:

- Suggested cache size when the cache is set up in conventional, extended, or expanded memory, and when your fixed disk is partitioned into multiple logical drives (Section 9.1).
- Tips on using ASTCache in floppy-based systems (Section 9.2).
- Using the MS-DOS BUFFERS command (Section 9.3).
- Basic parameters that you may use to configure ASTCache (Section 9.4).
- Advanced installation parameters that can be used after ASTCache installation (Section 9.5).

9.1 Suggested Cache Size

The larger your cache, the less frequently your AST Premium must access disk drives to retrieve data. Minimizing disk access increases computer speed. Therefore, the best cache size is the largest one you can afford.

9.1.1 Conventional Memory Setup

If you are setting up your cache in conventional memory, cache size will most likely be limited to the amount of memory not needed by other applications.

The easiest way to determine the amount of memory available for caching is simply to examine your software documentation to find the minimum memory your applications require. Subtract this amount from the total amount of conventional memory to arrive at maximum cache size (entered using the /R:xxx parameter described in Section 9.4).

9.1.2 Expanded or Extended Memory Setup

If you plan to set up your cache in either expanded or extended memory, you should make the cache as large as possible. (To do so, use the /A + or /E + parameters and do not give a value to /S and /R).

If you plan to run an application that will require expanded memory, use /A + /R:xxx where xxx is the amount of memory in kilobytes (KB) you wish to reserve for the application.

For information about installing a cache in extended memory with RAM disks, print spoolers, and so on, see Section 9.5.

9.1.3 Multiple Logical Drive Setup

If your fixed disk is partitioned into multiple logical drives, you should specify a cache size of at least 96 KB.

9.2 Changing Diskettes

When you are using ASTCache on a diskette system, the program will sometimes display a prompt before the diskette drives have stopped operating and the lights have turned off. You do not have to wait for the diskette drive lights to turn off before entering a response to the prompt.

CAUTION

If an application asks you to change diskettes, you must wait until the drive lights have turned off before removing the existing diskette from the drive.

9.3 DOS Buffers Command

Many applications recommend that you use the DOS BUFFERS command to establish as many as 15 to 20 buffers (of 512 KB each). With ASTCache, this number of buffers is not necessary. As a matter of fact, most programs run well with ASTCache and only two buffers (the default) installed. Some DOS commands like CHKDSK run fastest with about six buffers.

You should experiment with the applications you use most to determine the minimum number of buffers required to achieve the best performance.

9.4 Basic Parameters

This section discusses the basic ASTCache parameters that are used to install the utility, and provides examples using the basic parameters.

9.4.1 Installation Parameters

ASTCache is installed by entering a one-line command. When ASTCache processes this command it uses a number of different parameters to determine how to set itself up in your computer's memory. For your convenience each parameter has a default value--the value that will be used if you do not instruct the program otherwise. To select parameter values other than the defaults, add each parameter and its value to the command when you invoke ASTCache. Several sample invocation commands are given later in this section.

If you wish to change the parameters after installing ASTCache, use the /U parameter to un-install it, and then invoke it again using the new parameters.

The following is a discussion of the parameters which you are most likely to use during your first installation of ASTCache. If you wish to fine-tune ASTCache to your particular hardware and software environment, see Section 9.5 for information on additional parameters.

/A + -- Expanded Memory Assignment

This parameter assigns expanded memory for ASTCache use. Expanded memory is non-linear, paged RAM that conforms to the Lotus/Intel/Microsoft Expanded Memory Specification.

NOTE

When the cache is set up in expanded memory, only a small amount of conventional memory is used by ASTCache. The exact amount used is dependent on usage of the /T parameter option (see Section 9.5).

Default: /A-.

/E + -- Extended Memory Assignment

This parameter assigns extended memory for ASTCache use. Extended memory is linear RAM installed beyond the DOS limit of 640 KB with 80286 or 80386 processors.

NOTE

If you are using a RAM disk, a print spooler, or an application that may be using extended memory, read about the /E:xxxx parameter in Section 9.5.

Default: /E-.

/R:xxx -- Non-Cache Memory Reserve

This parameter reserves xxx KB of the memory type used by the cache for programs loaded after ASTCache. Allocate the rest of the conventional, expanded, or extended memory to the cache.

If the cache is set up in *conventional memory* (the default), xxx KB of conventional memory will be reserved for application programs and resident programs which you load after ASTCache.

If the cache is set up in *expanded memory* (using /A +), xxx KB of expanded memory will be reserved for programs which are loaded after ASTCache. The majority of the ASTCache program, its cache index, and the cache of disk sectors will reside in expanded memory. A small amount of conventional memory will also be used by the ASTCache program.

If the cache is set up in *extended memory* (using /E +), xxx KB of extended memory will be reserved for programs which are loaded after ASTCache. Conventional memory will be used for the ASTCache program, its cache index, and the track buffer (see /T + in Section 9.5) while the cache itself will reside in extended memory.

The /R parameter is often more convenient than the /S parameter (see the following description) because it allows ASTCache to calculate its cache size based on your estimate of how much memory your applications require.

Default: /R:232 for conventional memory. /R:0 for expanded (/A +) and extended (/E +) memory

/S:xxx -- Cache Memory Reserve

This parameter allocates xxx KB of RAM for use by the ASTCache program.

If the cache is set up in conventional memory, xxx KB of conventional memory are used for the ASTCache program as well as the cache. The value of xxx should be between 48 and 512.

If the cache is set up in expanded memory, xxx KB of expanded memory are allocated for the program, the cache index, and the cache itself. The value of xxx should be between 48 and 1072. A small amount of conventional memory is also used.

If the cache is set up in extended memory, xxx KB of extended memory is used for the cache. The value of xxx should be between 32 and 1024. Additional conventional memory is used for the program and an index that allows rapid access to the cache in extended memory.

Default: If the /S parameter is not specified, the /R parameter default applies.

9.4.2 Installation Examples

The following are sample invocations of the ASTCache program and their meaning:

1. **ASTCACHE /R:232**

Install the ASTCache program in conventional memory and reserve 232 KB for applications which will be loaded later. Allocate the rest of conventional memory to the ASTCache program and its cache.

2. **ASTCACHE /S:200**

Install the ASTCache program in conventional memory and allocate 200 KB to the program and its cache. Reserve the rest of conventional memory for application programs.

3. **ASTCACHE /A+ /R:256**

Install the ASTCache in expanded memory using all but 256 KB of expanded memory.

4. **ASTCACHE /E+ /S:384**

Install the ASTCache program in conventional memory and set up a 384-KB cache in extended memory.

9.5 Advanced Parameters

This section contains information on advanced parameters, including:

- Additional installation parameters (Section 9.5.1).
- Installation examples (Section 9.5.2).
- Post-installation parameters (Section 9.5.3).
- Post-installation examples (Section 9.5.4).

9.5.1 Additional Installation Parameters

Besides the basic parameters described in Section 9.4, a number of additional parameters are provided to allow you to customize the use of ASTCache to your hardware and software.

/B + -- Batch Copy

This parameter allows batches of sectors of data to be copied to and from the cache at one time. This, in turn, increases performance, especially when the cache is set up in extended memory.

When conventional or expanded memory is being used for the cache, this option does not affect the processing of hardware interrupts. When extended memory is being accessed, however, batch copying can increase the length of time interrupts are turned off.

Default: /B + .

/D + -- Floppy Drive Support

This parameter allows ASTCache to use advanced support to increase the performance of writing to floppy disk drives.

NOTE

To take advantage of advanced support for diskette transfers, your floppy disk controller must be supplied by AST Research or be 100% compatible with it.

If /D- is specified, generic support of your floppy disk drives will be provided. Generic support means that caching will be provided for your floppy disk drives but advanced support of writing to the diskettes will not.

Default: /D + . ASTCache checks your system and automatically assigns this default.

/E:xxxx -- Extended Memory Location

This parameter sets up the cache in extended memory above memory location xxxx KB.

The fASTdisk program provided with AST Premium utility software can set up a RAM disk in extended memory alongside ASTCache without special configuration information. This is true because ASTCache automatically recognizes that fASTdisk is using extended memory.

If you are using another brand of RAM disk (VDISK or RAMDRIVE.SYS, for example), it is possible that ASTCache will recognize its use of extended memory as well.

The information displayed by ASTCache when it is installed will help you determine whether the RAM disk can be set up alongside ASTCache in extended memory. In particular, take note of the following line:

/E+ Extended memory cache at yyyy KB.

If you have set up a RAM disk in extended memory, the value of yyyy should be greater than or equal to 1024 plus the size of the RAM disk in KB. For instance, if you have one 512-KB RAM disk (which will use extended memory from address 1024 KB to 1536 KB [1024 + 512]), ASTCache will inform you that it has allocated memory above 1536 KB for itself by specifying an address equal or greater to 1536 KB.

If you are using a RAM disk, print spooler, or an application program that ASTCache cannot detect, ASTCache will assume that it has extended memory all to itself. In this case the cache may overlap other applications' use of extended memory. For example, if you have 1024 KB of extended memory and specify a cache size of 768 KB, the cache will be placed in the top of extended memory (2048 KB in this case) down to location 1280 KB. If you also have set up a 512-KB RAM disk in extended memory, it probably will start at location 1024 KB and end just below 1536 KB, causing a 256-KB (1536 - 1280) overlap between the RAM disk and cache. You can remedy this by specifying a smaller cache size (512 KB in this case).

Alternatively, you may reserve an extended memory location for programs which do not use one of the above mentioned allocation techniques.

You may specify a minimum address for ASTCache's cache area in extended memory. To do so, specify /E:xxxx where xxxx is the minimum address where extended memory is available to the cache. For example, if you have one 512-KB RAM disk, the correct minimum address for the cache would be 1024 KB + 512 KB = 1536 KB and the appropriate parameter would be /E:1536. This specification would cause ASTCache to skip the first 512 KB

of extended memory used by the RAM disk and only allocate extended memory above memory address 1536 KB to its cache.

Default: /E:1024 (when /E + is specified).

/H + -- Fixed Disk Drive Support

This parameter allows ASTCache to use advanced support to enhance the performance of writing to fixed disk drives.

If /H- is specified, generic support of your fixed disk drives will be provided. Generic support means that caching will be provided for your fixed disks but advanced support of writing to the disks will not.

Default: /H + .

/O + -- Disk Transfer Support

This parameter uses an optional algorithm to give reads priority over writes for advanced support of disk transfers.

This option speeds up diskette transfers when the /D + option is in effect and fixed disk transfers when the /H + option is in effect.

NOTE

Depending on the nature of your applications and the speed of your disk drives, this option may provide an additional performance gain. To determine which setting provides the best performance gain with your applications you may want to perform a test which compares the effect of using the /O- and the O + settings.

The /O + option usually improves the operation of the /Q + parameter (see the /Q + -- return to DOS -- parameter description later in this section) when you copy files from one fixed disk directory to another or from your fixed disk to a diskette.

Default: /O-.

/P + -- Default Parameter Display

Display all parameters in effect when the ASTCache is loaded.

Since some of the default values are determined by ASTCache, it is good idea to display the parameters in effect when the program is loaded. This way, you can check actual defaults with the values you expect to be defaults. You can also use the display to better decide which values to change.

If you prefer, however, you may suppress this display by using the /P- parameter.

Default: /P +.

/Q + -- Return to DOS

This parameter quickly returns the DOS prompt.

When you are using the /D + or /H + option, this parameter will sometimes allow the DOS prompt to be returned while disk transfers associated with the previous command or application are still being completed. Returning the prompt allows you to enter additional commands while the disk transfers are taking place.

NOTE

Be sure to wait for the lights on all your disk drives to go off before changing any diskettes.

If you select this option, you probably will want to specify the /O + parameter.

Default: /Q-.

/T + -- Track Caching

This parameter reads the rest of a track into cache memory whenever an application requests a disk read.

Disk space is divided into tracks which are composed of sectors. There are typically nine sectors per diskette track and seventeen sectors per fixed disk track. By using the /T + option, you allow ASTCache to read more sectors from the disk at one time. Because DOS frequently requests information from nearby sectors soon after requesting a given sector, reading the rest of the track in advance usually increases performance.

Using the /T + option requires about 7 KB more conventional memory than the /T- option. For diskette-only systems, /T + requires about 3 KB more memory than /T-.

In almost all cases, reading the entire track will improve the overall performance of your applications. However, there are three cases where you may want to select /T- instead:

- You have very little conventional memory to spare. Specifying /T- can save you between 3 and 7 KB.
- Your application accesses many small files scattered throughout the disk. In this case, reading the rest of the track may gain you very little and, in some cases, may "bump" sectors in the cache that are read frequently -- decreasing performance slightly.
- Your disk has many bad sectors that have been "mapped out". If the files you are reading are on the same tracks as these bad sectors, reading the rest of a track may generate an error. ASTCache will automatically back off and read only the data originally requested, but valuable time may be wasted.

Default: /T +.

/T:xx -- Track Buffer

This parameter performs track buffering using a conventional memory buffer that will hold up to xx sectors.

When the /T + option is selected, you will notice that ASTCache automatically chooses a buffer size and informs you of its size on the line where the /T + parameter is confirmed in the parameter display.

If you prefer that ASTCache use a different buffer size, use the /T:xx option. Specifying a buffer size smaller than the default will usually decrease performance slightly. Specifying a buffer size larger than the default will usually have no effect on the performance of fixed disks or diskettes.

Default: /T:xx where xx is set to the number of sectors of the largest disk track in your system.

/V + -- Diskette Change Detection

This parameter uses any available volume-change detection hardware to detect the change of diskettes in a diskette drive.

This parameter is relevant for the high-capacity and 3.5-inch diskette drives. These diskette drives are often capable of detecting when a drive door has been opened. This volume-change detection hardware reduces the software overhead required to detect the change of the diskette in the drive. To indicate that some of your diskette drives include this detection hardware, use the /V + parameter.

Default: /V + .

/W + -- Write Request Check

This parameter checks write requests against the cache to determine if the disk already has identical data. If identical data is found, ASTCache suppresses the write. Usually this will improve performance somewhat.

NOTE

With extended memory, you may find that performance improves if you specify /W-.

Default: /W + .

/-x -- Disk Restriction

This parameter does not provide drive x with the caching function.

If you should desire to restrict caching to certain drives, you may do so by specifying which drives should not be cached. Add a /-x parameter, where x is a drive letter, for each drive which should not be cached. For example, if you have two fixed disk drives and do not wish to cache drive D, you should specify:

ASTCACHE /-D

Some copy-protected programs will refuse to recognize a key diskette when it is cached. This parameter allows you to specify that the drive containing the key diskette not be cached.

You can also use this parameter to dedicate the cache to a specific drive by specifying all other drives should not be cached.

Some users may occasionally use a diskette drive to access diskettes which do not use the DOS format (when importing data from a CP/M diskette for example). In this case the drive definitely should not be cached.

If you request no caching on a diskette drive that serves as two logical drives (for example, drive A and B), the ASTCache program will inform you that it has suppressed caching on both logical drives.

Default: All diskette and fixed disk drives are cached. RAM disks and remote network drives are not cached.

9.5.2 Installation Examples

The following are sample invocations of the ASTCache program using advanced parameters.

1. `ASTCACHE /E/R:0/B-/T-`

Set up the cache in extended memory using as much extended memory as possible. Suppress batch copies to minimize the amount of time during which interrupts are turned off. Do not read any more of a track than has been requested by DOS or the application.

2. `ASTCACHE /S:128/-A/H+`

Set up a 128-KB cache in conventional memory to be used for all drives except drive A. Use advanced support to speed up writing to fixed disks.

9.5.3 Post-installation Parameters

The following parameters can be used once the ASTCache program has been installed.

/M -- Measurements

This parameter will cause disk cache measurements to be displayed.

These measurements include the number of disk transfer requests made by the system and applications, the number of actual physical transfers from the disk, the number of disk transfers saved by the cache, and the percentage of overall transfer requests saved by the cache.

/F -- Cache Flush

This parameter returns the cache to its initial state by flushing it and resetting its measurements to zero.

This may be useful when performing benchmarks of application performance.

NOTE

Do not confuse the operation of this parameter with writing new data to the disk. ASTCache always keeps your disks up to date. That is, all data which DOS requests be written to disk is written immediately.

/P -- Current Parameter Display

This parameter displays all parameters currently in effect.

/U -- Un-installation

This parameter un-installs ASTCache.

Un-installing ASTCache this way is useful if you wish to reinstall it with a different set of parameters. For example, you might want to use all of your expanded memory for the cache in most situations. Then, when you load an application which supports expanded memory you may want to reserve some expanded memory for that application while it is in use.

9.5.4 Post-installation Examples

The following are sample post-installation invocations of the ASTCache program and their meaning.

1. `ASTCACHE /P`

Display the parameters currently in effect.

2. `ASTCACHE /M/U`

Display measurements and then un-install the program.

NOTES



GLOSSARY

ASTCache

A software utility that sets up a *disk cache* in *random access memory*.

ASTMENU

A software utility that provides AST Premium computer users with a *common user interface* for running system tests, installing utilities, and configuring a fixed disk.

ASTSETUP

A software utility that assists you in defining your AST Premium's computer configuration. Configuration information from ASTSETUP is stored in battery-maintained *CMOS* memory so it will be available automatically every time you start or restart your computer.

AUTOEXEC.BAT file

A file on your boot disk that contains commands to be carried out automatically whenever you boot the computer.

Base I/O address

The address the computer uses to communicate with a device attached to it. Unless otherwise specified, each device installed in or attached to the computer uses its own unique I/O address.

Base memory

Another name for *conventional memory*.

Boot (or boot up)

To start your computer. For a cold boot, turn your system off-then-on or press the RESET button on the front panel. For a warm boot, press < Ctrl > - < Alt > - < Del > while the computer is on.



Boot disk

A disk containing programs required to start your computer. A boot disk can be a diskette or fixed disk drive.

Byte

The basic unit of measure for computer memory. A character -- such as a letter of the alphabet -- uses one byte of memory. Computer memory is often measured in *kilobytes* (approximately one thousand bytes) or *megabytes* (about one million bytes).

Each byte is made up of eight *bits*. For more information on bytes and bits, see an introductory book on computers.



Cache

See *disk cache*.

CMOS

Complementary metal-oxide semiconductor memory. The memory that stores the configuration information entered when you run ASTSETUP. CMOS memory uses very little power and stores the configuration information even when the computer is turned off.

CONFIG.SYS file

A file on the boot disk that configures MS-DOS. The commands in a CONFIG.SYS file (if one exists on your boot disk) are carried out before those in an AUTOEXEC.BAT file. Usually, the commands load device drivers into your system.



A CONFIG.SYS file must be present on your boot disk if you want to use the bus master on the AST Advanced Disk Controller or create a FASTdisk (AST's RAM fixed disk).

Conventional memory

Also called *base memory*. Computer memory between 0 and 640 KB. MS-DOS can directly access all conventional memory. Your computer does not need any special software to use conventional memory.

Default

The value of a parameter before you make any change to it.

Disk

The device used by the computer to record and play back information. "Disk" can refer to floppy diskettes, fixed disks, and RAM disks.

Disk cache

A software device that accumulates copies of recently-used disk sectors in *random access memory*. The application program can then read these copies without accessing the disk. This, in turn, speeds up the performance of the application.

A disk cache is similar to a *RAM disk* but with an important difference. Data stored on a RAM disk will be lost if not copied to a physical disk before shut down or power failure. Data stored in a disk cache is a copy of data already stored on the physical disk, so no backup is necessary and no data can be lost.

Disk operating system (DOS)

Microsoft Disk Operating System (MS-DOS) is the most common operating system for the AST Premium/386, as well as the AST Premium/286.

An operating system supervises the computer's operation, including handling input/output (I/O). Application programs and users can request MS-DOS services. A user might request MS-DOS services to copy files or format a diskette. An application program might use MS-DOS to obtain keyboard input, write data to a file, or write data to a screen.

Because different versions of MS-DOS request services differently, it is important to be sure that your application software is compatible with the version of MS-DOS you are using.

Display adapter

The part of the computer that runs the monitor.

Expanded Memory

Memory beyond the 640-KB limit that must be accessed by *memory paging*. Special software conforming to the EMS or EEMS specifications use expanded memory.

Expanded memory manager

A program that performs *memory paging*. *REMM* is an example of an expanded memory manager.

Extended memory

Linear memory in the 1- to 16-MB address range. Under MS-DOS, extended memory is usually used for *RAM disks* and *print spoolers* (see *fASTdisk* and *SuperSpool*).

Extended partition

A non-bootable portion of your fixed disk under MS-DOS control. It can control one to 23 logical drives (named D to Z).

FASTdisk

A software utility that sets up a disk in random access memory (*RAM disk*).

Fixed disk

Also called "hard" or "winchester" disks. Fixed disks are attached to the computer, and can be installed or removed. Data written to a fixed disk remains until it is overwritten or corrupted.

Floppy diskette

Removable disks, also called "floppies" or "diskettes." 3-1/2" floppy diskettes are also called microfloppies.

I/O

Input/output. Refers to peripheral devices (such as printers) that are addressed via an I/O address. (See *base I/O address*.)

Kilobyte (KB)

1,024 bytes (see *byte*). An amount of memory such as "8 KB" is shorthand for 8192 bytes.

Linear memory

Any memory that can be addressed without memory paging. Linear memory includes both conventional and extended memory.

Logical drive

Also called logical volume or volume. A logical drive appears to MS-DOS as a physically separate drive, even though several logical drives may be part of only one larger physical drive. For example, one physical 40-MB fixed disk might consist of one 32-MB logical drive, and one 8-MB logical drive.

Low-level (physical) format

Also known as a media format. This procedure divides a fixed or floppy disk into *tracks* and *sectors* and identifies *media defects*.

This type of formatting is generic. It can be recognized by any *disk operating system (DOS)*.

Media defect

A bad disk sector. If identified during *low-level formatting*, the disk will not attempt to write to that part of the disk.

Megabyte (MB)

1,024 kilobytes (see *kilobyte* and *byte*).

Memory paging

A technique that allows your computer to address non-linear memory above 640 KBs. See also *expanded memory*.

MS-DOS format

A procedure that writes control structures to the disk that MS-DOS recognizes, such as the directory and file allocation tables that allow disk file management.

Partition

To divide a fixed disk into areas of fixed memory size for convenient use. There can be a maximum of eight partitions on a fixed disk. The maximum size of a partition is 32 KB. In MS-DOS, each partition is either a *primary* or *extended*.

Primary partition

A bootable portion of your fixed disk under MS-DOS control. The primary partition is designated as the *logical drive C*.

Print Spooler

A memory buffer program that accepts print files so computer memory is free to perform other tasks while the file is printing (see *SuperSpool*).

RAM disk

A program that allows you to use part of the computer's memory as if it were a disk (see *fASTdisk*).

It is faster to read and write to RAM than to disk. Storing information on a RAM disk can speed up applications that use disk information frequently.

RAM disks are erased when the computer is powered down (turned off) or rebooted. This means that you must save any data you want to keep on a floppy or fixed disk.

Random access memory (RAM)

The computer's system memory, including *conventional* and *extended memory*. You can write to and read from RAM. (RAM is not the same as read-only memory -- *ROM*).

Read-only memory (ROM)

Permanent computer memory dedicated to a particular function. For example, the instructions for starting the computer when you first turn on power are contained in ROM. You cannot write to ROM. (ROM is not the same as random access memory -- RAM).

REMM

A software utility that manages *expanded memory* (see *expanded memory manager*).

REX

A software utility that allows *expanded memory* to emulate *extended memory*. REX must be installed whenever extended memory allocations exceed the amount of extended memory available.

Sector

Also known as "disk sector." The portion of a *track* that is numbered and can hold a specified number of characters (usually 512 KB).



Starting memory address

To access memory, the computer must specify a particular location -- the memory address. The first memory addresses are assigned to system memory. System memory starts at 0 KB.

Starting addresses for devices added later depend on how much memory is already installed in the computer.

SuperSpool

A software utility that sets up a *print spooler* in *random access memory*.

Track

Any of the concentric paths on the surface of a disk, divided into *sectors* and used for the recording of data.



Volume

Another name for a *logical drive*.



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